

Amendments to the Claims:

1-23. (canceled)

24. (original) An apparatus fabricated on a semiconductor substrate for determining a full match for a variable length search key, comprising:

an embedded processor complex including a plurality of protocol processors and an internal control point processor that provide frame processing;

a plurality of hardware accelerator co-processors accessible to each protocol processor and providing high speed pattern searching, data manipulation, and frame parsing;

a plurality of programmable memory devices that store a plurality of data structures that represent at least one search tree, wherein the data structures include a direct table, a pattern search control block and a leaf; and

an control memory arbiter that controls the access of each protocol processor to the plurality of memory devices.

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25. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 24 further comprising a tree search engine that operates in parallel with protocol processor execution to perform tree search instructions including memory reads and writes and memory range checking.
26. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 24 wherein the plurality of memory devices further comprises at least one of internal static random access memory, external static random access memory, and external dynamic random access memory.
27. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 24 wherein the control memory arbiter manages control memory operations by allocating memory cycles between the plurality of protocol processors and the plurality of memory devices.
28. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 24 wherein each protocol processor comprises a primary data buffer, a scratch pad data buffer and control registers for data store operations.

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29. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 24 further comprising a hash box component that performs a geometric hash function on the search key.
30. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 24 further comprising a programmable search key register and a programmable hashed key register.
31. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 30 further comprising a programmable color key register to enable sharing a single table data structure among a plurality of independent search trees.
32. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 31 wherein the contents of the color register, if enabled, are appended to the hash output to produce a final hashed key.
33. (original) The apparatus fabricated on a semiconductor substrate for determining the full match of claim 31 wherein if the color register is not enabled, appending an equivalent number of zeros to the hash output to produce a final hashed key.

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34-45. (canceled)